

Analysis of Nutrition Composition of Schisandra Fruits

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Abstract. A systematically analysis of nutritional composition of *Schisandra chinensis* and appreciation on its value of utilization were made for exploring a new way of utilization. The results showed that the fruit of *Schisandra* contains rich in kinds of vitamins, amino acids, organic acids and microelements that fit with human body. Its kernal contains the fatty acids with high value of utilization. Linoleic acid accounts for 50.7% of the amount of fatty acids in in kernel. The contents of the trace element Fe, Zn are also higher. Ve's content of *Schisandra* is 8 times of the orange.

Key words: *Schisander chinensis*, Chemical composition, Nutrition analysis

Introduction

Schisandra is a deciduous vine of *Magnoliaceae*. Its fruits taste of sweet, sour, bitter, peppery and salty. It is one of the traditional Chinese herbal medicine. *Schisandar* (*Magnoliaceae*) has been used as precious tonic and astringent drug for alleviating cough since ancient time. Modern medicine research indicates that *Schisandra* can improve working effect of organic body, reduce tiredness, and increase immunity of organic body. Its bark and fruits have strong fragrance and fruits taste delicious. Its branch and bark are used as flavoring by Chinese people besides as medicine. Nearly 40 chemical compounds have been separated from *Schisandra*. All these compounds separated belong to derivatives of lignin. In order to explore its products and utilization, we analyzed comprehensively the nutrition composition of fruits of *Schisandra chinensis* and appreciated nutritious value.

Materials and Methods

Fruits were picked from Qinghe Forest Bureau in autumn of 1992 and dried naturally. Through adverse current extraction, the specifies gravity of juice was 1.06, dissolved solid from matter was 15.16g/100 ml

The method of Lowry was adopted for determining content of protein in its juice. The Lane-Eynon method was used for determining sugar. The atomic absorption spectrophotometer method was for Fe, Zn. High effect liquid chromatography method was for carton, vitamin (C, E, B₁, B₂) and nicotinic acid. High effect liquid chromatography of derivatives in front of the column method was for amino acid. Ion chromatography method was for lemon acid, apple acid and tartaric.

Results

The crude juice was gotten by adverse correct extraction, The general nutrition composition were determined, including ash content, sugar, acid, protein (Table 1).

Table 1. The contents of ash content, sugar, acid and prote in *Schisandra chinensis* crude juice (mg/100g)

Ash content	Protein	Sugar	Acid
1.042	0.14	29.03	3.93

Gas chromatography was adopted for determining organic acids of crude juice(Table 2).

Table 2. The contents of organic acids in *Schisandra chinensis* crude juice (mg/100g)

Lemon acid	Apple acid	Tartaric acid
55.18	40.55	4.29

We used high perfomance liquid chromatography to determine the contents of vitamins (See Table 3)

Table 3. The contents of vitamins in the fruits of *schisandra chinensis* (mg/100g)

Carotin	Nicotinic acid	V _c	V _E	V _{B1}	V _{B2}
40	41.7	218.2	4.31	0.47	1.09

The content of oil in seed is 37.21%. Specific gravity is 0.959. Acid value is 3.4. Iodine value is 131.08 The contents of fatty acids which are easy absorbed by homebody are given in Table 4.

Table 4. The components of fatty acids in oil of *Schisandra chinensis* seed (%)

Oleic acid	Linoleic acid	Flax acid
24.1	50.7	5.8

Amount of free amino acid and trace elements is higher in *Schisandra chinensis* fruits. Determining results are showed as Table 5, 6.

Table 5. The contents of amino acids in *Schisandra chinensis* fruits (mg/100g)

Item	Amount	Item	Amount
Aspartic acid	615	Arginine	108.43
Glutamic acid	400	Valine	44.9
Proline	150	Tyrosine	148.46
Glycine	186	Histidine	13.81
Cystine	a little	Lysine	32.5
Methionine	13.81	Serine	47.28
Phenylalanine	72		

Table 6. The contents of trace element in *Schisandra chinensis* fruits (PPM)

Fe	Cu	Zn	Se
116.0	6.77	48.77	0.023

Conclusion

Schisandra chinensis contains a large quantity of vitamins. The content of V_c is 218.2 mg/100g, that is 6.4 times of orange, 5.5 times of lemon, 20 times of apple. The content of V_E that is against old and feeble is 4.31 mg/100g, which is 8 times of orange, 8.6 times of peach.

The volatile oil of *Schisandra chinensis* contained fatty acid that is essential needs to human body. The content of linoleic acid reaches 50.7%, which is of great significance to reduce blood fat and to prevent and cure arteriosclerosis. Those amino acid are easy to be dieted and absorbed. Especially eight essential amino acids such as phenylalanine acids, phenylalanine and lysine etc. were of higher amount. There are still higher amount of aspartic acid, glutamic acid, serine and glycine. They can promote absorption of Fe. This explains its nutrition function and values.

As for trace elements, Fe and Ze are higher in contents, and they are all needed by people body, especially Fe, which plays an important physiological role in con-

veying oxygen and transferring electron. The shortage of Fe is a world problem. It is very difficult for people to enhance the amount of absorption of Fe only on food. Therefore *Schisandra chinensis* is an important source for people to add Fe.

Schisandra chinensis has bright-colored fruit with thicker flavor. Besides being eaten directly, the fruits can be made for drinking and wine by crude juice. They are all good for health. Local people call its fruits as mountain Zanthoxylum. It can be drawn flavoring essence as condiment. Its value used in medicine is more known by people. *Schisandra chinensis* resources are abundant and it also fits to cultivate. This gives a convenience condition for further deep processing and studying.

Schisandra chinensis can reduce hydroxyproline that was released by skin and tail tendon of small mouse. It has the effect against old and feeble, against low temperature by test of fruit fly.

Qualitative analysis on various chemical compositions showed that *Schisandra chinensis* does not have alkaloid and glucoside mater. Test by AMES method was positive. So *Schisandra chinensis* is a very good plant resources from the point of view of health protection and prevent illness.

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